Log Event A

Borehole 30-04-02

Borehole Information

Farm : C	**Tank :** C-104	**Site Number :** 299-E27-67
N-Coord : 42,827	**W-Coord :** 48,365	**TOC Elevation :** 646.65
Water Level, ft :	**Date Drilled :** 12/31/1972	

Casing Record

Type : Steel-welded	Thickness, in. : 0.280	ID, in. : 6
Top Depth, ft. : 0	Bottom Depth, ft. : 135	

Borehole Notes:

This borehole was drilled in December 1972 to a depth of 135 ft using 6-in. casing. The drilling report does not indicate if the borehole casing was perforated or grouted. The casing thickness is presumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. steel tubing. The top of the casing, which is the zero reference for the SGLS, is approximately flush with the ground surface.

Equipment Information

Logging System : 2	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 10/1996	**Calibration Reference :** GJO-HAN-13	**Logging Procedure :** P-GJPO-1783

Log Run Information

Log Run Number :	1	**Log Run Date :**	02/19/1997	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	0.0	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	26.5	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Run Number :	2	**Log Run Date :**	02/20/1997	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	134.5	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** Y
Finish Depth, ft. :	103.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Run Number :	3	**Log Run Date :**	02/20/1997	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	25.5	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	52.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Borehole 30-04-02

Log Event A

Log Run Number :	4	**Log Run Date :**	02/21/1997	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	104.0	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	73.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Run Number :	5	**Log Run Date :**	02/21/1997	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	51.0	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	64.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Run Number :	6	**Log Run Date :**	02/24/1997	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	74.0	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	64.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Run Number :	7	**Log Run Date :**	02/24/1997	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	50.0	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	30.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Analysis Information

Analyst : E. Larsen

Data Processing Reference : P-GJPO-1787 Analysis Date : 07/02/1997

Analysis Notes :

This borehole was logged by the SGLS in seven log runs. Six log runs were required to the log the length of the borehole. The seventh log run was performed as an additional quality assurance check on a segment of one of the primary log runs. The pre- and post-survey field verification spectra met the acceptance criteria established for the peak shape and detector efficiency, confirming that the SGLS was operating within specifications. The energy calibration and peak-shape calibration from these spectra were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation.

Casing correction factors for a 0.280-in.-thick steel casing were applied during analysis.

The man-made radionuclides Cs-137, Co-60, and U-235 were detected in this borehole. Continuous Cs-137 contamination was detected from the ground surface to 27 ft, 50 to 56.5 ft, and 61.5 to 64.5 ft. A few small zones of Cs-137 contamination were detected between 35 ft and at the bottom of the logged interval. A zone of Co-60 contamination was detected from 38 to 58.5 ft. A few occurrences of Co-60 were detected between 60.5 and 63.5 ft. A single occurrence of U-235 was detected at the ground surface.

Most of the U-238 concentration data are absent between the ground surface and 11.5 ft.

The K-40 concentration values increase at 39 ft and remain elevated to a depth of 63 ft. The K-40

Log Event A

Borehole 30-04-02

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Reports for tanks C-104 and C-105.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

The interval between 30 and 50 ft was relogged as a quality assurance measure to establish the repeatability of the radionuclide concentration measurements. The radionuclide concentrations shown were calculated using the separate data sets provided by the original and rerun logging runs.